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FREDRIKSON & BYRON, P.A. INTELLECTUAL PROPERTY GROUP 200 SOUTH SIXTH STREET, SUITE 4000 MINNEAPOLIS, MN 55402			EXAMINER	RALIS, STEPHEN J
ART UNIT	PAPER NUMBER			3742
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

IP@FREDLAW.COM

<b>Office Action Summary</b>	<b>Application No.</b> 10/556,704	<b>Applicant(s)</b> PETTERSEN, OLA
	<b>Examiner</b> STEPHEN J. RALIS	<b>Art Unit</b> 3742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 10 November 2005.
- 2a) This action is FINAL.      2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-12 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-12 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 10 November 2005 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-878)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>11/10/2005</u> | 6) <input type="checkbox"/> Other: _____  |

***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

***Drawings***

2. The drawings are objected to because the electric arc (34) is not shown in all pertinent drawings; the term guard ring does not have the proper identifier; and shading is not utilized to differentiate between parts. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because: reference character "24" has been used to designate both knurling and the knurled surface; reference character "25" has been used to designate both knurling and cavity/cavities; and reference character "9" has been used to designate both middle portion and the connecting piece. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

In general, the drawings are replete with such issues. The above notes are exemplary with respect to all of the drawing objections present in the instant case, all drawings must be carefully reviewed and appropriate corrections should be made in response to this rejection.

***Specification***

4. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract

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on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

5. The abstract of the disclosure is objected to because the abstract contains the phrase "The present invention relates to...". Correction is required. See MPEP § 608.01(b).

***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. The claims are generally narrative and indefinite, failing to conform with current U.S. practice. They appear to be a literal translation into English from a foreign document and are replete with grammatical and idiomatic errors.

Claim 1 provides for the use of new type of connecting piece of electrically conductive material, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass.

A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claims 1-12 recite the phrases "characterized in that"; "preferably"; "for example". It is unclear and indefinite to whether this is a positive limitation. Further clarification is required.

Claim 1 recites the limitation "appropriate constellations". It is unclear and indefinite to what exactly a constellation that is appropriate defines. Claim 2 recites the limitation "this object" in line 4. It is unclear and indefinite to what "this other object" references. Further clarification is required.

Claims 1, 2, 5 and 6 recite the limitation "its". It is unclear and indefinite to what exactly "its" references. Further clarification is required.

Claims 1 recites the limitation "a brazing block (11) in line 9; "brazing block (11) in line 11; and "the brazing block (11) through out the claims. It is unclear and indefinite to how many "brazing blocks" are in the claims. Claims 3-12, recites the limitation "A connection piece of electrically conductive material according to Claim 2..". It is unclear and indefinite to how many connection pieces of electrically conductive material are in the claims. Further clarification is required to either further differentiate the elements or provide proper antecedent basis.

Claim 1 recites the limitation "the object" in line 6; Claim 2 recites the limitation "the top side" in lines 8-9,16; the limitation "the brazing block (11)" in line 9; the limitation "the heat absorption capability" in line 11; the limitation "the surface layer" in lines 14-15; the limitation "the carbon layer (26)" in lines 16, 29, 30; the limitation "the

fact" in line 21; the limitation "the matter" in line 21; the limitation "the higher temperatures" in line 22; the limitation "the heat conductivity" in line 22; the limitation "the substance" in line 23; the limitation "the connecting piece (4)" in line 24; the limitation "the energy" in lines 24-25; the limitation "the local ridges and peaks" in line 25; the limitation "the ignition and maintaining" in lines 26-27; the limitation "the carbon electrode (21)" in line 28; and the limitation "the thickness" in line 29; Claim 3 recites the limitation "the brazing clip (14)" in lines 2, 4, 6-8; the limitation "the brazing block (11)" in lines 5, 7, 9; There is insufficient antecedent basis for at least these limitations in the claim.

9. Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: The relationship between the brazing block (11) and one or several brazing blocks (11).

*In general, the claims are replete with such 35 U.S.C. 112, second paragraph issues. The above notes are exemplary with respect to all of the 35 U.S.C. 112, second paragraph rejections present in the instant case, all claims must be carefully reviewed and appropriate corrections should be made in response to this rejection.*

***Double Patenting***

10. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the

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unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

11. Claim 1, as best understood, is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,800,000 in view of Huber (U.S. Patent No. 2,022,544), Black (U.S. Patent No. 2,834,551), Linderman (U.S. Patent No. 1,369,927) and Scott (U.S. Patent No. 3,828,706).

Claim 1 of U.S. Patent No. 6,800,000 discloses all the limitations of the claimed method of manufacturing a new type of connecting piece of electrically conducting material except specifically calling for the brazing clip consisting of two clamping tabs which are pressed into the front portion of brazing block, and two side portions outside the front portion of the brazing block and the brazing clip being oriented in a transversal direction with respect to the brazing block , and the middle portion being formed so that a semicircular raised guiding edge of a shape adapted to a guard ring attached during

the brazing process is formed in connection with the front portion, and the surface of the front portion of the brazing block being superficially modified by blasting, knurling and/or with cavities, or other surface-modifying measure.

However, a brazing clip consisting of two side portions outside a front portion of a brazing block and the brazing clip being oriented in a transversal direction with respect to the brazing block is known in the art. Huber, for example, teaches a brazing clip (brazing cap 5) consisting of two side portions (side portion 7) outside a front portion (front portion of sheath 3) of the brazing block (sheath 3) and the brazing clip (brazing cap 5) being oriented in a transversal direction with respect to the brazing block (sheath 3) (page 1, lines 2-30; see Figures 1-5). Huber further teaches such a configuration presents a means to provide the capability of withstanding excessive vibrations (page 1, lines 1-12; page 2, lines 2-19), thereby increasing the operational longevity of the bond.

Similarly, the brazing clip consisting of two clamping tabs which are pressed into the front portion of brazing block is known in the art. Linderman, for example, teaches a brazing clip (6/5 combination) consisting of two clamping tabs (top portion; see Figures 16-19) which are pressed into the front portion (front portion of sleeve 2) of brazing block (sleeve 2) (page 2, lines 6-24; see Figures 16-19). It is known in the art that such a configuration provides a means to ensure an element is held in position and secured, thereby increasing the longevity of the physical bond.

In addition, a middle portion being formed so that a raised guiding edge of a shape adapted to a guard ring attached during the brazing process is formed in connection with the front portion is known in the art. Scott, for example, teaches a

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middle portion (portion 62; see Figure 12) being formed so that a raised guiding edge (transition between 60 and 62) of a shape adapted to a guard ring attached during the brazing process is formed in connection with the front portion (portion 60). Scott further teaches such a configuration provides a means to not machine the entire workpiece (column 5, lines 3-15), thereby decreasing manufacturing costs. In addition, Scott teaches the work hardening of a portion of the tongue (12) could be utilized in forming any of the many possible terminal connections (column 5, lines 13-15).

Moreover, a surface of a front portion of a brazing block being superficially modified by blasting, knurling and/or with cavities, or other surface-modifying measure is known in the art. Black, for example, teaches a surface of the front portion (body portion 14) of the brazing block (terminal fitting10) being superficially modified by blasting, knurling and/or with cavities, or other surface-modifying measure (grooves 22, 24, 22', 24'; column 1, line 46 – column 2, line 25; see Figures 1-8). Black further teaches such a configuration provides a means to remove the rail bond terminal from the rail without damaging the rail bond terminal, thereby allowing the rail bond terminal to be utilized again (column 1, lines 17-25).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the brazing clip of claim 1 of U.S. Patent No. 6,800,000 with the brazing clip consisting of two side portions outside a front portion of a brazing block and the brazing clip being oriented in a transversal direction with respect to the brazing block of Huber in order to present a means to provide the capability of withstanding excessive vibrations, thereby increasing the operational longevity of the

bond. Similarly, in view of Linderman, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the brazing clip of claim 1 of U.S. Patent No. 6,800,000 in view of Huber with the brazing clip consisting of two clamping tabs which are pressed into the front portion of brazing block to position the elements together, since it is known in the art that such a configuration provides a means to ensure an element is held in position and secured, thereby increasing the longevity of the physical bond. In addition, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the middle portion of claim 1 of U.S. Patent No. 6,800,000 with the middle portion being formed so that a raised guiding edge of a shape adapted to a guard ring attached during the brazing process is formed in connection with the front portion of Scott in order to provide a means to not machine the entire workpiece, thereby decreasing manufacturing costs. Furthermore, to provide the raised guiding edge being a semicircular raised guiding edge of a shape adapted to a guard ring attached during the brazing process is formed in connection with the front portion would have been a mere engineering expediency as Scott clearly teaches the potential of shaping the tongue of the terminal to a required terminal configuration in order to provide a means to not machine the entire workpiece. And moreover, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the brazing block of claim 1 of U.S. Patent No. 6,800,000 with the brazing block being superficially modified by blasting, knurling and/or with cavities, or other surface-modifying measure of Black in order to provide a means to

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remove the rail bond terminal from the rail without damaging the rail bond terminal, thereby allowing the rail bond terminal to be utilized again.

12. Claim 2, 4, 5, 8 and 12, as best understood, are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 2-6 of U.S. Patent No. 6,800,000 in view of Huber (U.S. Patent No. 2,022,544), Black (U.S. Patent No. 2,834,551), Linderman (U.S. Patent No. 1,369,927) and Scott (U.S. Patent No. 3,828,706).

Claim 1 of U.S. Patent No. 6,800,000 discloses all the limitations of the claimed connecting piece of electrically conducting material except specifically calling for a secured brazing clip encompassing the front portion and partially pressed into the top side, at least the top side of the front portion of the brazing block having had its surface enlarged by blasting and/or knurling or other surface-modifying measure so that the heat-absorption capability of the front portion from the electric arc manipulating the surface and the carbon deposit formed on the surface by the carbon electrode has increased, which thereby enables a rapid initial increase in temperature in the surface layer during the brazing process the surface layer, resulting in a more secure connection between the carbon layer and the top side of the front portion, a rapid initial increase in temperature in the front portion and in the brazing clip, resulting in a reduction of oxidation interference before the braze joint has been formed, and a relative reduction in cooling effect, mainly by heat conduction partially because of a changed ratio of surface to mass, partially because of the fact that the matter diverting

the heat does not reach the higher temperatures at which the heat conductivity of the substance increases, which factors thereby together enable a dimensional increase of the connecting piece and a relative reduction of the energy necessary for the brazing process, and the local ridges and peaks functioning to concentrate electrons or electron holes to facilitate the ignition and maintaining of an electric arc between the joint part and the carbon electrode, and cavities made in the surface draining and reducing the thickness of the carbon deposit and comprising anchoring points for the carbon deposit.

However, a secured brazing clip encompassing the front portion and partially pressed into the top side, at least the top side of the front portion of the brazing block having had its surface enlarged by blasting and/or knurling or other surface-modifying measure is known in the art. Black, for example, teaches a surface of the front portion (body portion 14) of the brazing block (terminal fitting 10) being superficially modified by blasting, knurling and/or with cavities, or other surface-modifying measure (grooves 22, 24, 22', 24'; column 1, line 46 – column 2, line 25; see Figures 1-8). Black further teaches such a configuration provides a means to remove the rail bond terminal from the rail without damaging the rail bond terminal, thereby allowing the rail bond terminal to be utilized again (column 1, lines 17-25). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the brazing block of claims 2-6 of U.S. Patent No. 6,800,000 with the brazing block being superficially modified by blasting, knurling and/or with cavities, or other surface-modifying measure of Black in order to provide a means to remove the rail bond terminal from the rail

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without damaging the rail bond terminal, thereby allowing the rail bond terminal to be utilized again.

With respect to the limitations of "so that the heat-absorption capability of the front portion from the electric arc manipulating the surface and the carbon deposit formed on the surface by the carbon electrode has increased, which thereby enables a rapid initial increase in temperature in the surface layer during the brazing process the surface layer, resulting in a more secure connection between the carbon layer and the top side of the front portion, a rapid initial increase in temperature in the front portion and in the brazing clip, resulting in a reduction of oxidation interference before the braze joint has been formed, and a relative reduction in cooling effect, mainly by heat conduction partially because of a changed ratio of surface to mass, partially because of the fact that the matter diverting the heat does not reach the higher temperatures at which the heat conductivity of the substance increases, which factors thereby together enable a dimensional increase of the connecting piece and a relative reduction of the energy necessary for the brazing process, and the local ridges and peaks functioning to concentrate electrons or electron holes to facilitate the ignition and maintaining of an electric arc between the joint part and the carbon electrode, and cavities made in the surface draining and reducing the thickness of the carbon deposit and comprising anchoring points for the carbon deposit", MPEP § 2114 clearly states "While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. Black clearly teaches a surface of the front portion (body portion 14) of the

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brazing block (terminal fitting 10) being superficially modified by blasting, knurling and/or with cavities, or other surface-modifying measure (grooves 22, 24, 22', 24'; column 1, line 46 – column 2, line 25; see Figures 1-8). Because claim 2 fails to further limit the apparatus in terms of structure, but rather only recite further functional limitations, the invention as taught by claims 2-6 of U.S. Patent No. 6,800,000 in view of Black deemed fully capable of performing such function. Therefore since claims 2-6 of U.S. Patent No. 6,800,000 in view of Black explicitly teaches the structure and the functionality to perform the operation, the reference is complete as detail, as set forth above.

13. Claim 3, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over claims 2-6 of U.S. Patent No. 6,800,000 in view of Black (U.S. Patent No. 2,834,551) as applied to claims 2, 4, 5, 8 and 12 above, and further in view of Huber (U.S. Patent No. 2,022,544) and Linderman (U.S. Patent No. 1,369,927).

Claims 2-6 of U.S. Patent No. 6,800,000 in view of Black discloses all of the claimed limitations, as previously set forth, except for specifically calling for a brazing clip being formed from a piece of sheet metal not being hole-punched, and both overlying clamping tabs (15) of the brazing clip being pressed into a top surface of a front portion of a brazing block while side portions of the bottom surface of the brazing clip have been pressed into the brazing block, and no flux existing between the brazing block and the brazing clip, and corners and short sides of the brazing clip not protruding outside the body of the brazing block.

However, a brazing clip being formed from a piece of sheet metal not being hole-punched, and no flux existing between the brazing block and the brazing clip is known in the art. Huber, for example teaches a brazing clip (brazing cap 5) consisting of two side portions (side portion 7) being formed from a piece of sheet metal not being hole-punched, and no flux existing between a brazing block (sheath 3) and the brazing clip (brazing cap 5). Huber further teaches such a configuration presents a means to provide the capability of withstanding excessive vibrations (page 1, lines 1-12; page 2, lines 2-19), thereby increasing the operational longevity of the bond.

Similarly, a brazing clip being formed with overlying clamping tabs and the brazing clip being pressed into a top surface of a front portion of a brazing block while side portions of the bottom surface of the brazing clip have been pressed into the brazing block is known in the art. Linderman, for example, teaches a brazing clip (6/5 combination) being formed with overlying clamping tabs (top portion; see Figures 16-19) and the brazing clip (6/5 combination) being pressed into a top surface of a front portion (front portion of sleeve 2) of a brazing block (sleeve 2) while side portions (6/5 combination) of the bottom surface of the brazing clip (6/5 combination) have been pressed into the brazing block (sleeve 2). It is known in the art that such a configuration provides a means to ensure an element is held in position and secured, thereby increasing the longevity of the physical bond.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the brazing clip of claims 2-6 of U.S. Patent No. 6,800,000 in view of Black with the brazing clip being formed from a piece of sheet

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metal not being hole-punched, and no flux existing between the brazing block and the brazing clip of Huber in order to present a means to provide the capability of withstanding excessive vibrations, thereby increasing the operational longevity of the bond. Similarly, in view of Linderman, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the brazing clip of claims 2-6 of U.S. Patent No. 6,800,000 in view of Huber with the brazing clip consisting of two clamping tabs which are pressed into the front portion of brazing block to position the elements together, since it is known in the art that such a configuration provides a means to ensure an element is held in position and secured, thereby increasing the longevity of the physical bond. Moreover, to provide the corners and short sides (16) of the brazing clip to not protrude outside the body of the brazing block would have been a mere engineering expediency as Linderman clearly teaches the pressing of the brazing clip in order to get a tighter fit.

14. Claim 6, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over claims 2-6 of U.S. Patent No. 6,800,000 in view of Black (U.S. Patent No. 2,834,551) as applied to claims 2, 4, 5, 8 and 12 above, and further in view of Shaver (U.S. Patent No. 2,019,935).

Claims 2-6 of U.S. Patent No. 6,800,000 in view of Black discloses all of the claimed limitations, as previously set forth, except for specifically calling for an end portion of a brazing block of a joint part being shaped for and joined with a connection pipe, intended to subsequently receive in its other end a cable or thread.

However, an end portion of a block of a joint part being shaped for and joined with a connection pipe, intended to subsequently receive in its other end a cable or thread is known in the art. Shaver, For example, teach an end portion (boss 14) of a block (terminal 5) of a joint part being shaped for and joined with a connection pipe (sleeve 11), intended to subsequently receive in its other end a cable or thread (conductor 4) Shaver further teaches such a configuration presents a means to provide a substantially flush connector end (page 2, lines 35-48). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the an end portion of the brazing block of a joint part of claims 2-6 of U.S. Patent No. 6,800,000 in view of Black with the end portion of a block of a joint part being shaped for and joined with a connection pipe, intended to subsequently receive in its other end a cable or thread of Shaver in order to provide a substantially flush connector end.

15. Claims 7 and 11, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over claims 2-6 of U.S. Patent No. 6,800,000 in view of Black (U.S. Patent No. 2,834,551) as applied to claims 2, 4, 5, 8 and 12 above, and further in view of Genter (U.S. Patent No. 2,244,248).

Claims 2-6 of U.S. Patent No. 6,800,000 in view of Black discloses all of the claimed limitations, as previously set forth, except for specifically calling for an end portion of a brazing block of a joint part being shaped with a connection where one or several threaded bolt portions are secured; and the end portion of the brazing block of the joint part being provided with one or several mounting holes.

However, an end portion of a block of a joint part being shaped with a connection where one or several threaded bolt portions are secured; and the end portion of the block of the joint part being provided with one or several mounting holes is known in the art. Genter, for example, teaches an end portion (surface 16) of a block (clamping plate 7) of a joint part being shaped with a connection where one or several threaded bolt (bolt 10) portions are secured; and the end portion (surface 16) of the block (clamping plate 7) of the joint part being provided with one or several mounting holes (9). Genter further teaches such a configuration provides a means for drawing and securing the plate in position (column 2, lines 33-38). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to the brazing block modify claims 2-6 of U.S. Patent No. 6,800,000 in view of Black an end portion of a block of a joint part being shaped with a connection where one or several threaded bolt portions are secured; and the end portion of the block of the joint part being provided with one or several mounting holes in order to provide a means for drawing and securing the plate in position.

16. Claims 9 and 10, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over claims 2-6 of U.S. Patent No. 6,800,000 in view of Black (U.S. Patent No. 2,834,551) as applied to claims 2, 4, 5, 8 and 12 above, and further in view of Shuler (U.S. Patent No. 1,770,629).

Claims 2-6 of U.S. Patent No. 6,800,000 in view of Black discloses all of the claimed limitations, as previously set forth, except for specifically calling for an end

portion of a block of the joint part being provided with one or several tongues which are folded and pressed around or support optional elements; and the end portion of the block of the joint part being provided with side wings which are folded and pressed around a cable or thread, whereupon the compression joint is being brazed or welded.

However, an end portion of a block of the joint part being provided with one or several tongues which are folded and pressed around or support optional elements; and the end portion of the block of the joint part being provided with side wings which are folded and pressed around a cable or thread, whereupon the compression joint is being brazed or welded is known in the art. Shuler, for example, teach an end portion (see Figures 1-3) of the block (attachment 4) of the joint part being provided with one or several tongues (fingers 5) which are folded and pressed around or support optional elements (cable 3); and the end portion (see Figures 1-3) of the block (attachment 4) of the joint part being provided with side wings (fingers 5) which are folded and pressed around a cable or thread (cable 3), whereupon the compression joint is being brazed or welded (page 1, lines 30-72). Shuler further teaches such a configuration provides a means to engage closely the ends of the cable (page 1, lines 44-46). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the an end portion of the brazing block of a joint part of claims 2-6 of U.S. Patent No. 6,800,000 in view of Black with the end portion of a block of the joint part being provided with one or several tongues which are folded and pressed around or support optional elements; and the end portion of the block of the joint part being provided with side wings which are folded and pressed around a cable or thread,

whereupon the compression joint is being brazed or welded of Shuler in order to provide a means to engage closely the ends of the cable.

Regarding the last two lines of claim 10 (describing how the compression joint is made i.e. welded or brazed), the limitation merely recites a product by process limitation. It is well settled that reciting how a product is made does not further limit the structure of the product itself. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted.) Therefore, an end portion (see Figures 1-3) of the block (attachment 4) of the joint part being provided with one or several tongues (fingers 5) which are folded and pressed around or support optional elements fully meets the limitations given its broadest reasonable interpretation.

#### ***Claim Rejections - 35 USC § 101***

17. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

18. Claim 1 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35

U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

***Claim Rejections - 35 USC § 103***

19. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

20. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

21. Claims 1, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Pettersen (U.S. Publication No. 2002/0173207) in view of Scott (U.S. Patent No. 3,828,706) and Black (U.S. Patent No. 2,834,551).

Pettersen'207 discloses a method of manufacturing a new type of connecting piece (1) of electrically conductive material (paragraphs 10, 11, 35-43, 45, 46, 61-68; see Figures 15-22) preferably a cable shoe, holder or connection device, (paragraph 45) which is to be joined with another object of electrically conductive material (claims 1, 2) using a brazing process without residual detrimental martensite structure in the object

under the braze joint (claims 1, 2), characterized in that a homogeneous body (see Figures 15-18) consisting of front portion (front part of compact tapering plate 27), middle portion (middle part of compact tapering plate 27) and end portion (opposite end part of compact tapering plate 27), is formed into a brazing block (combination 27, 1, 9), which, in its front portion (front part of compact tapering plate 27) is compressed by a brazing clip (soldering clip 26) to comprise a joint part, the brazing clip (soldering clip 26) consisting of two underlying parts (see Figures 15-18) and two clamping tab (see Figures 17, 18) which are pressed into the front portion (front part of compact tapering plate 27) of brazing block (combination 27, 1, 9) and also an underlying middle portion (see Figures 17, 8) and two side portions (see Figures 15-18) outside a front portion (front portion of compact tapering plate 27) of the brazing block (combination 27, 1, 9) and the brazing clip (soldering clip 26) being oriented in a transversal direction with respect to the brazing block (combination 27, 1, 9) (see Figures 1-5), and the end portion (opposite end part of compact tapering plate 27) of the brazing block (11) being formed to a co-operating part, and the brazing block (combination 27, 1, 9) alone or joined in appropriate constellations using, for example, pressing, brazing, riveting, drilling or welding with other co-operating parts such as rings, pipes, threaded bolt parts, holes, wings, tongues, hooks or other brazing-block parts, as well as cables or threads, comprising a connecting piece (electrical connection into tube 9), for example, cable shoe, holder or connection device.

Pettersen'207 discloses all of the limitations of the claimed invention, as previously set forth, except for specifically calling the middle portion (9) being formed so

that a semicircular raised guiding edge (12) of a shape adapted to a guard ring (22) attached during the brazing process is formed in connection with the front portion (8), and the surface of the front portion (8) of the brazing block being superficially modified by blasting, knurling and/or with cavities, or other surface-modifying measure.

However, a middle portion being formed so that a raised guiding edge of a shape adapted to a guard ring attached during the brazing process is formed in connection with the front portion is known in the art. Scott, for example, teaches a middle portion (portion 62; see Figure 12) being formed so that a raised guiding edge (transition between 60 and 62) of a shape adapted to a guard ring attached during the brazing process is formed in connection with the front portion (portion 60). Scott further teaches such a configuration provides a means to not machine the entire workpiece (column 5, lines 3-15), thereby decreasing manufacturing costs. In addition, Scott teaches the work hardening of a portion of the tongue (12) could be utilized in forming any of the many possible terminal connections (column 5, lines 13-15).

Similarly, a surface of a front portion of a brazing block being superficially modified by blasting, knurling and/or with cavities, or other surface-modifying measure is known in the art. Black, for example, teaches a surface of the front portion (body portion 14) of the brazing block (terminal fitting 10) being superficially modified by blasting, knurling and/or with cavities, or other surface-modifying measure (grooves 22, 24, 22', 24'; column 1, line 46 – column 2, line 25; see Figures 1-8). Black further teaches such a configuration provides a means to remove the rail bond terminal from

the rail without damaging the rail bond terminal, thereby allowing the rail bond terminal to be utilized again (column 1, lines 17-25).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the middle portion of Pettersen'207 with the middle portion being formed so that a raised guiding edge of a shape adapted to a guard ring attached during the brazing process is formed in connection with the front portion of Scott in order to provide a means to not machine the entire workpiece, thereby decreasing manufacturing costs. Furthermore, to provide the raised guiding edge being a semicircular raised guiding edge of a shape adapted to a guard ring attached during the brazing process is formed in connection with the front portion would have been a mere engineering expediency as Scott clearly teaches the potential of shaping the tongue of the terminal to a required terminal configuration in order to provide a means to not machine the entire workpiece. And similarly, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the brazing block of Pettersen'207 with the brazing block being superficially modified by blasting, knurling and/or with cavities, or other surface-modifying measure of Black in order to provide a means to remove the rail bond terminal from the rail without damaging the rail bond terminal, thereby allowing the rail bond terminal to be utilized again.

22. Claims 2, 4, 5, 7, 8, 11 and 12, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Pettersen (U.S. Publication No. 2002/0173207) in view of Black (U.S. Patent No. 2,834,551).

With respect to the limitation of claim 2, Pettersen'207 discloses a connecting piece of electrically conductive material (paragraphs 43-48, 51, 55-57, 59-61, 66, 67; see Figures 9-11), preferably a cable shoe, a holder or a connection device, (paragraph 45) which is to be joined with another object of electrically conductive material (claims 1, 2) using a brazing process without residual detrimental martensite structure in this other object (claims 1, 2), characterized in that the connecting piece's joint part consists of a homogeneous brazing block (combination 27, 1, 9) consisting of front portion (front part of compact tapering plate 27), middle portion (middle part of combination 27, 1, 9) and end portion (end part of tube 9), and a secured brazing clip (soldering clip 26) encompassing the front portion (front part of compact tapering plate 27). Pettersen further discloses a carbon deposit (paragraph 43) formed on the surface by the carbon electrode (6).

With respect to the limitations of claims 4 and 8, Pettersen'207 discloses the end portion (tube 9) of the brazing block (combination 27, 1, 9) of the joint part is shaped to fit into a pipe portion (see Figures 15-18), that a cable or thread (electrical connection into tube 9), together with the joint part (rail workpiece 14; paragraphs 69; claims 1, 2), are inserted into a pipe portion (see Figures 15-18) that is being compressed, and that the compression joint is being brazed or welded.

Regarding the last two lines of claim 4 (i.e. describing how the joint/pipe portion is formed; and the compression joint is being brazed or welded), the limitation merely recites a product by process limitation. It is well settled that reciting how a product is made does not further limit the structure of the product itself. "[E]ven though product-

by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted.). Therefore, the end portion (opposite end part of compact plate 26) of the brazing block (compact plate 26) of the joint part is shaped to fit into a pipe portion (see Figure 10) fully meets the limitations given its broadest reasonable interpretation.

With respect to the limitations of claim 5, Pettersen'207 discloses the front portion (front part of compact tapering plate 27) of the brazing block (combination 27, 1, 9) of the joint part (see Figures 15-18) being dimensioned to allow for modification of its shape according to the workpiece (rail 14) using available pressure from the guard ring (soldering device) together with the reached temperature, thereby accomplishing an evenly thick braze joint.

With respect to the limitations of claim 7, Pettersen'207 discloses the end portion (end part of compact plate 31) of the brazing block (compact plate 31) of the joint part being shaped with a connection where one or several threaded bolt portions are secured (paragraphs 39, 65; see Figure 19).

With respect to the limitations of claim 11, Pettersen'207 discloses the end portion (end part of connecting piece 34) of the brazing block (connecting piece 34) of the joint part being provided with one or several mounting holes (see Figure 21).

With respect to the limitations of claim 12, Pettersen discloses the front portion (front part of compact plate 26) of the brazing block (combination 27, 1, 9) of the joint part being common to one or several brazing blocks (combination 27, 1, 9) (see Figures see Figures 15-18, 22).

Pettersen'207 discloses all of the limitations of the claimed invention, as previously set forth, except for a secured brazing clip encompassing the front portion and partially pressed into the top side, at least the top side of the front portion of the brazing block having had its surface enlarged by blasting and/or knurling or other surface-modifying measure so that the heat-absorption capability of the front portion from the electric arc manipulating the surface and the carbon deposit formed on the surface by the carbon electrode has increased, which thereby enables a rapid initial increase in temperature in the surface layer during the brazing process the surface layer, resulting in a more secure connection between the carbon layer and the top side of the front portion, a rapid initial increase in temperature in the front portion and in the brazing clip, resulting in a reduction of oxidation interference before the braze joint has been formed, and a relative reduction in cooling effect, mainly by heat conduction partially because of a changed ratio of surface to mass, partially because of the fact that the matter diverting the heat does not reach the higher temperatures at which the heat conductivity of the substance increases, which factors thereby together enable a dimensional increase of the connecting piece and a relative reduction of the energy necessary for the brazing process, and the local ridges and peaks functioning to concentrate electrons or electron holes to facilitate the ignition and maintaining of an

electric arc between the joint part and the carbon electrode, and cavities made in the surface draining and reducing the thickness of the carbon deposit and comprising anchoring points for the carbon deposit.

However, a secured brazing clip encompassing the front portion and partially pressed into the top side, at least the top side of the front portion of the brazing block having had its surface enlarged by blasting and/or knurling or other surface-modifying measure is known in the art. Black, for example, teaches a surface of the front portion (body portion 14) of the brazing block (terminal fitting 10) being superficially modified by blasting, knurling and/or with cavities, or other surface-modifying measure (grooves 22, 24, 22', 24'; column 1, line 46 – column 2, line 25; see Figures 1-8). Black further teaches such a configuration provides a means to remove the rail bond terminal from the rail without damaging the rail bond terminal, thereby allowing the rail bond terminal to be utilized again (column 1, lines 17-25). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the brazing block of Pettersen'207 with the brazing block being superficially modified by blasting, knurling and/or with cavities, or other surface-modifying measure of Black in order to provide a means to remove the rail bond terminal from the rail without damaging the rail bond terminal, thereby allowing the rail bond terminal to be utilized again.

With respect to the limitations of "so that the heat-absorption capability of the front portion from the electric arc manipulating the surface and the carbon deposit formed on the surface by the carbon electrode has increased, which thereby enables a rapid initial increase in temperature in the surface layer during the brazing process the

surface layer, resulting in a more secure connection between the carbon layer and the top side of the front portion, a rapid initial increase in temperature in the front portion and in the brazing clip, resulting in a reduction of oxidation interference before the braze joint has been formed, and a relative reduction in cooling effect, mainly by heat conduction partially because of a changed ratio of surface to mass, partially because of the fact that the matter diverting the heat does not reach the higher temperatures at which the heat conductivity of the substance increases, which factors thereby together enable a dimensional increase of the connecting piece and a relative reduction of the energy necessary for the brazing process, and the local ridges and peaks functioning to concentrate electrons or electron holes to facilitate the ignition and maintaining of an electric arc between the joint part and the carbon electrode, and cavities made in the surface draining and reducing the thickness of the carbon deposit and comprising anchoring points for the carbon deposit", MPEP § 2114 clearly states "While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. Black clearly teaches a surface of the front portion (body portion 14) of the brazing block (terminal fitting10) being superficially modified by blasting, knurling and/or with cavities, or other surface-modifying measure (grooves 22, 24, 22', 24'; column 1, line 46 – column 2, line 25; see Figures 1-8). Because claim 2 fails to further limit the apparatus in terms of structure, but rather only recite further functional limitations, the invention as taught by Pettersen'207 in view of Black deemed fully capable of performing such function. Therefore since Pettersen'207 in view of Black explicitly

teaches the structure and the functionality to perform the operation, the reference is complete as detail, as set forth above.

23. Claim 3, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Pettersen (U.S. Publication No. 2002/0173207) in view of Black (U.S. Patent No. 2,834,551) as applied to claims 2, 4, 5, 7, 8, 11 and 12 above, and further in view of Huber (U.S. Patent No. 2,022,544) and Linderman (U.S. Patent No. 1,369,927).

Pettersen'207 in view of Black discloses all of the claimed limitations, as previously set forth, except for specifically calling for a brazing clip being formed from a piece of sheet metal not being hole-punched, and both overlying clamping tabs (15) of the brazing clip being pressed into a top surface of a front portion of a brazing block while side portions of the bottom surface of the brazing clip have been pressed into the brazing block, and no flux existing between the brazing block and the brazing clip, and corners and short sides of the brazing clip not protruding outside the body of the brazing block.

However, a brazing clip being formed from a piece of sheet metal not being hole-punched, and no flux existing between the brazing block and the brazing clip is known in the art. Huber, for example teaches a brazing clip (brazing cap 5) consisting of two side portions (side portion 7) being formed from a piece of sheet metal not being hole-punched, and no flux existing between a brazing block (sheath 3) and the brazing clip (brazing cap 5). Huber further teaches such a configuration presents a means to

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provide the capability of withstanding excessive vibrations (page 1, lines 1-12; page 2, lines 2-19), thereby increasing the operational longevity of the bond.

Similarly, a brazing clip being formed with overlying clamping tabs and the brazing clip being pressed into a top surface of a front portion of a brazing block while side portions of the bottom surface of the brazing clip have been pressed into the brazing block is known in the art. Linderman, for example, teaches a brazing clip (6/5 combination) being formed with overlying clamping tabs (top portion; see Figures 16-19) and the brazing clip (6/5 combination) being pressed into a top surface of a front portion (front portion of sleeve 2) of a brazing block (sleeve 2) while side portions (6/5 combination) of the bottom surface of the brazing clip (6/5 combination) have been pressed into the brazing block (sleeve 2). It is known in the art that such a configuration provides a means to ensure an element is held in position and secured, thereby increasing the longevity of the physical bond.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the brazing clip of Pettersen'207 with the brazing clip being formed from a piece of sheet metal not being hole-punched, and no flux existing between the brazing block and the brazing clip of Huber in order to present a means to provide the capability of withstanding excessive vibrations, thereby increasing the operational longevity of the bond. Similarly, in view of Linderman, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the brazing clip of Pettersen'207 in view of Huber with the brazing clip consisting of two clamping tabs which are pressed into the front portion of brazing block to position the

elements together, since it is known in the art that such a configuration provides a means to ensure an element is held in position and secured, thereby increasing the longevity of the physical bond. Moreover, to provide the corners and short sides of the brazing clip to not protrude outside the body of the brazing block would have been a mere engineering expediency as Linderman clearly teaches the pressing of the brazing clip in order to get a tighter fit.

24. Claim 6, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Pettersen (U.S. Publication No. 2002/0173207) in view of Black (U.S. Patent No. 2,834,551) as applied to claims 2, 4, 5, 8 and 12 above, and further in view of Shaver (U.S. Patent No. 2,019,935).

Pettersen'207 in view of Black discloses all of the claimed limitations, as previously set forth, except for specifically calling for an end portion of a brazing block of a joint part being shaped for and joined with a connection pipe, intended to subsequently receive in its other end a cable or thread.

However, an end portion of a block of a joint part being shaped for and joined with a connection pipe, intended to subsequently receive in its other end a cable or thread is known in the art. Shaver, for example, teaches an end portion (boss 14) of a block (terminal 5) of a joint part being shaped for and joined with a connection pipe (sleeve 11), intended to subsequently receive in its other end a cable or thread (conductor 4). Shaver further teaches such a configuration presents a means to provide a substantially flush connector end (page 2, lines 35-48). It would have been obvious to

one of ordinary skill in the art at the time of the invention was made to modify the an end portion of the brazing block of a joint part of Pettersen'207 in view of Black with the end portion of a block of a joint part being shaped for and joined with a connection pipe, intended to subsequently receive in its other end a cable or thread of Shaver in order to provide a substantially flush connector end.

25. Claims 9 and 10, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Pettersen (U.S. Publication No. 2002/0173207) in view of Black (U.S. Patent No. 2,834,551) as applied to claims 2, 4, 5, 8 and 12 above, and further in view of Shuler (U.S. Patent No. 1,770,629).

Pettersen'207 in view of Black discloses all of the claimed limitations, as previously set forth, except for specifically calling for an end portion of a block of the joint part being provided with one or several tongues which are folded and pressed around or support optional elements; and the end portion of the block of the joint part being provided with side wings which are folded and pressed around a cable or thread, whereupon the compression joint is being brazed or welded.

However, an end portion of a block of the joint part being provided with one or several tongues which are folded and pressed around or support optional elements; and the end portion of the block of the joint part being provided with side wings which are folded and pressed around a cable or thread, whereupon the compression joint is being brazed or welded is known in the art. Shuler, for example, teach an end portion (see Figures 1-3) of the block (attachment 4) of the joint part being provided with one or

several tongues (fingers 5) which are folded and pressed around or support optional elements (cable 3); and the end portion (see Figures 1-3) of the block (attachment 4) of the joint part being provided with side wings (fingers 5) which are folded and pressed around a cable or thread (cable 3), whereupon the compression joint is being is being brazed or welded (page 1, lines 30-72). Shuler further teaches such a configuration provides a means to engage closely the ends of the cable (page 1, lines 44-46). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the an end portion of the brazing block of a joint part of Pettersen'207 in view of Black with the end portion of a block of the joint part being provided with one or several tongues which are folded and pressed around or support optional elements; and the end portion of the block of the joint part being provided with side wings which are folded and pressed around a cable or thread, whereupon the compression joint is being brazed or welded of Shuler in order to provide a means to engage closely the ends of the cable.

Regarding the last two lines of claim 10 (describing how the compression joint is made i.e. welded or brazed), the limitation merely recites a product by process limitation. It is well settled that reciting how a product is made does not further limit the structure of the product itself. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a

different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted.) Therefore, an end portion (see Figures 1-3) of the block (attachment 4) of the joint part being provided with one or several tongues (fingers 5) which are folded and pressed around or support optional elements fully meets the limitations given its broadest reasonable interpretation.

26. Claims 1, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Pettersen (U.S. Publication No. 2002/0190097) in view of Huber (U.S. Patent No. 2,022,544), Black (U.S. Patent No. 2,834,551), Linderman (U.S. Patent No. 1,369,927) and Scott (U.S. Patent No. 3,828,706).

Pettersen'097 discloses a method of manufacturing a new type of connecting piece of electrically conductive material (paragraphs 43-48, 51, 55-57, 59-61, 66, 67; see Figures 9-11), preferably a cable shoe, holder or connection device, (cable shoe 10) which is to be joined with another object of electrically conductive material (rail workpiece 14; paragraphs 43-48, 51, 56-57, 59-61, 66, 67) using a brazing process without residual detrimental martensite structure in the object under the braze joint (Abstract), characterized in that a homogeneous body (compact plate 26) consisting of front portion (front part of compact plate 26), middle portion (middle part of compact plate 26) and end portion (opposite end part of compact plate 26), is formed into a brazing block (compact plate 26), which, in its front portion (front part of compact plate 26) is compressed by a brazing clip (12) to comprise a joint part, the brazing clip (12) consisting of two underlying parts (see Figures 10b, 11) and one clamping tab (see

Figures 10b, 11) which are pressed into the front portion (front part of compact plate 26) of brazing block (compact plate 26) and also an underlying middle portion (see Figure 11), and the end portion (opposite end part of compact plate 26) of the brazing block (11) being formed to a co-operating part, and the brazing block (compact plate 26) alone or joined in appropriate constellations using, for example, pressing, brazing, riveting, drilling or welding with other co-operating parts such as rings, pipes, threaded bolt parts, holes, wings, tongues, hooks or other brazing-block parts, as well as cables or threads, comprising a connecting piece (electrical connection 25; paragraph 55; see Figure 8), for example, cable shoe, holder or connection device.

Pettersen'097 discloses all of the limitations of the claimed invention, as previously set forth, except for specifically calling for the brazing clip consisting of two clamping tabs which are pressed into the front portion of brazing block, and two side portions outside the front portion of the brazing block and the brazing clip being oriented in a transversal direction with respect to the brazing block , and the middle portion being formed so that a semicircular raised guiding edge of a shape adapted to a guard ring attached during the brazing process is formed in connection with the front portion, and the surface of the front portion of the brazing block being superficially modified by blasting, knurling and/or with cavities, or other surface-modifying measure.

However, a brazing clip consisting of two side portions outside a front portion of a brazing block and the brazing clip being oriented in a transversal direction with respect to the brazing block is known in the art. Huber, for example, teaches a brazing clip (brazing cap 5) consisting of two side portions (side portion 7) outside a front portion

(front portion of sheath 3) of the brazing block (sheath 3) and the brazing clip (brazing cap 5) being oriented in a transversal direction with respect to the brazing block (sheath 3) (page 1, lines 2-30; see Figures 1-5). Huber further teaches such a configuration presents a means to provide the capability of withstanding excessive vibrations (page 1, lines 1-12; page 2, lines 2-19), thereby increasing the operational longevity of the bond.

Similarly, the brazing clip consisting of two clamping tabs which are pressed into the front portion of brazing block is known in the art. Linderman, for example, teaches a brazing clip (6/5 combination) consisting of two clamping tabs (top portion; see Figures 16-19) which are pressed into the front portion (front portion of sleeve 2) of brazing block (sleeve 2) (page 2, lines 6-24; see Figures 16-19). It is known in the art that such a configuration provides a means to ensure an element is held in position and secured, thereby increasing the longevity of the physical bond.

In addition, a middle portion being formed so that a raised guiding edge of a shape adapted to a guard ring attached during the brazing process is formed in connection with the front portion is known in the art. Scott, for example, teaches a middle portion (portion 62; see Figure 12) being formed so that a raised guiding edge (transition between 60 and 62) of a shape adapted to a guard ring attached during the brazing process is formed in connection with the front portion (portion 60). Scott further teaches such a configuration provides a means to not machine the entire workpiece (column 5, lines 3-15), thereby decreasing manufacturing costs. In addition, Scott teaches the work hardening of a portion of the tongue (12) could be utilized in forming any of the many possible terminal connections (column 5, lines 13-15).

Moreover, a surface of a front portion of a brazing block being superficially modified by blasting, knurling and/or with cavities, or other surface-modifying measure is known in the art. Black, for example, teaches a surface of the front portion (body portion 14) of the brazing block (terminal fitting 10) being superficially modified by blasting, knurling and/or with cavities, or other surface-modifying measure (grooves 22, 24, 22', 24'; column 1, line 46 – column 2, line 25; see Figures 1-8). Black further teaches such a configuration provides a means to remove the rail bond terminal from the rail without damaging the rail bond terminal, thereby allowing the rail bond terminal to be utilized again (column 1, lines 17-25).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the brazing clip of Pettersen'097 with the brazing clip consisting of two side portions outside a front portion of a brazing block and the brazing clip being oriented in a transversal direction with respect to the brazing block of Huber in order to present a means to provide the capability of withstanding excessive vibrations, thereby increasing the operational longevity of the bond. Similarly, in view of Linderman, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the brazing clip of Pettersen'097 in view of Huber with the brazing clip consisting of two clamping tabs which are pressed into the front portion of brazing block to position the elements together, since it is known in the art that such a configuration provides a means to ensure an element is held in position and secured, thereby increasing the longevity of the physical bond. In addition, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify

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the middle portion of Pettersen'097 with the middle portion being formed so that a raised guiding edge of a shape adapted to a guard ring attached during the brazing process is formed in connection with the front portion of Scott in order to provide a means to not machine the entire workpiece, thereby decreasing manufacturing costs. Furthermore, to provide the raised guiding edge being a semicircular raised guiding edge of a shape adapted to a guard ring attached during the brazing process is formed in connection with the front portion would have been a mere engineering expediency as Scott clearly teaches the potential of shaping the tongue of the terminal to a required terminal configuration in order to provide a means to not machine the entire workpiece. And moreover, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the brazing block of Pettersen'097 with the brazing block being superficially modified by blasting, knurling and/or with cavities, or other surface-modifying measure of Black in order to provide a means to remove the rail bond terminal from the rail without damaging the rail bond terminal, thereby allowing the rail bond terminal to be utilized again.

27. Claims 2, 4, 5, 8 and 12, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Pettersen (U.S. Publication No. 2002/0190097) in view of Black (U.S. Patent No. 2,834,551).

With respect to the limitation of claim 2, Pettersen'097 discloses a connecting piece of electrically conductive material (paragraphs 43-48, 51, 55-57, 59-61, 66, 67; see Figures 9-11), preferably a cable shoe, a holder or a connection device, (cable shoe

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10) which is to be joined with another object of electrically conductive material (rail workpiece 14; paragraphs 43-48, 51, 56-57, 59-61, 66, 67) using a brazing process without residual detrimental martensite structure in this other object (Abstract), characterized in that the connecting piece's joint part consists of a homogeneous brazing block (compact plate 26) consisting of front portion (front part of compact plate 26), middle portion (middle part of compact plate 26) and end portion (opposite end part of compact plate 26), and a secured brazing clip (12) encompassing the front portion (front part of compact plate 26). Pettersen further discloses a carbon deposit (paragraph 43) formed on the surface by the carbon electrode (6).

With respect to the limitations of claims 4 and 8, Pettersen'097 discloses the end portion (opposite end part of compact plate 26) of the brazing block (compact plate 26) of the joint part is shaped to fit into a pipe portion (see Figure 10), that a cable or thread (electrical connection 25; paragraph 55; see Figure 8), together with the joint part (rail workpiece 14; paragraphs 43-48, 51, 56-57, 59-61, 66, 67), are inserted into a pipe portion (see Figure 10) that is being compressed, and that the compression joint is being brazed or welded.

Regarding the last two lines of claim 4 (i.e. describing how the joint/pipe portion is formed; and the compression joint is being brazed or welded), the limitation merely recites a product by process limitation. It is well settled that reciting how a product is made does not further limit the structure of the product itself. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not

depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted.). Therefore, the end portion (opposite end part of compact plate 26) of the brazing block (compact plate 26) of the joint part is shaped to fit into a pipe portion (see Figure 10) fully meets the limitations given its broadest reasonable interpretation.

With respect to the limitations of claim 5, Pettersen'097 discloses the front portion (front part of compact plate 26) of the brazing block (compact plate 26) of the joint part (see Figures 5, 6) being dimensioned to allow for modification of its shape according to the workpiece (rail 14; pipe 14) using available pressure from the guard ring (9; see Figures 4A, 4B, 4C, 5, 6) together with the reached temperature, thereby accomplishing an evenly thick braze joint.

With respect to the limitations of claim 12, Pettersen'097 discloses the front portion (front part of compact plate 26) of the brazing block (compact plate 26) of the joint part being common to one or several brazing blocks (compact plate 26) (see Figures see Figures 4A, 4B, 4C, 5, 6).

Pettersen'097 discloses all of the limitations of the claimed invention, as previously set forth, except for a secured brazing clip encompassing the front portion and partially pressed into the top side, at least the top side of the front portion of the brazing block having had its surface enlarged by blasting and/or knurling or other surface-modifying measure so that the heat-absorption capability of the front portion

from the electric arc manipulating the surface and the carbon deposit formed on the surface by the carbon electrode has increased, which thereby enables a rapid initial increase in temperature in the surface layer during the brazing process the surface layer, resulting in a more secure connection between the carbon layer and the top side of the front portion, a rapid initial increase in temperature in the front portion and in the brazing clip, resulting in a reduction of oxidation interference before the braze joint has been formed, and a relative reduction in cooling effect, mainly by heat conduction partially because of a changed ratio of surface to mass, partially because of the fact that the matter diverting the heat does not reach the higher temperatures at which the heat conductivity of the substance increases, which factors thereby together enable a dimensional increase of the connecting piece and a relative reduction of the energy necessary for the brazing process, and the local ridges and peaks functioning to concentrate electrons or electron holes to facilitate the ignition and maintaining of an electric arc between the joint part and the carbon electrode, and cavities made in the surface draining and reducing the thickness of the carbon deposit and comprising anchoring points for the carbon deposit.

However, a secured brazing clip encompassing the front portion and partially pressed into the top side, at least the top side of the front portion of the brazing block having had its surface enlarged by blasting and/or knurling or other surface-modifying measure is known in the art. Black, for example, teaches a surface of the front portion (body portion 14) of the brazing block (terminal fitting 10) being superficially modified by blasting, knurling and/or with cavities, or other surface-modifying measure (grooves 22,

24, 22', 24'; column 1, line 46 – column 2, line 25; see Figures 1-8). Black further teaches such a configuration provides a means to remove the rail bond terminal from the rail without damaging the rail bond terminal, thereby allowing the rail bond terminal to be utilized again (column 1, lines 17-25). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the brazing block of Pettersen'097 with the brazing block being superficially modified by blasting, knurling and/or with cavities, or other surface-modifying measure of Black in order to provide a means to remove the rail bond terminal from the rail without damaging the rail bond terminal, thereby allowing the rail bond terminal to be utilized again.

With respect to the limitations of "so that the heat-absorption capability of the front portion from the electric arc manipulating the surface and the carbon deposit formed on the surface by the carbon electrode has increased, which thereby enables a rapid initial increase in temperature in the surface layer during the brazing process the surface layer, resulting in a more secure connection between the carbon layer and the top side of the front portion, a rapid initial increase in temperature in the front portion and in the brazing clip, resulting in a reduction of oxidation interference before the braze joint has been formed, and a relative reduction in cooling effect, mainly by heat conduction partially because of a changed ratio of surface to mass, partially because of the fact that the matter diverting the heat does not reach the higher temperatures at which the heat conductivity of the substance increases, which factors thereby together enable a dimensional increase of the connecting piece and a relative reduction of the energy necessary for the brazing process, and the local ridges and peaks functioning to

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concentrate electrons or electron holes to facilitate the ignition and maintaining of an electric arc between the joint part and the carbon electrode, and cavities made in the surface draining and reducing the thickness of the carbon deposit and comprising anchoring points for the carbon deposit", MPEP § 2114 clearly states "While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. Black clearly teaches a surface of the front portion (body portion 14) of the brazing block (terminal fitting10) being superficially modified by blasting, knurling and/or with cavities, or other surface-modifying measure (grooves 22, 24, 22', 24'; column 1, line 46 – column 2, line 25; see Figures 1-8). Because claim 2 fails to further limit the apparatus in terms of structure, but rather only recite further functional limitations, the invention as taught by Pettersen in view of Black deemed fully capable of performing such function. Therefore since Pettersen in view of Black explicitly teaches the structure and the functionality to perform the operation, the reference is complete as detail, as set forth above.

28. Claim 3, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Pettersen (U.S. Publication No. 2002/0190097) in view of Black (U.S. Patent No. 2,834,551) as applied to claims 2, 4, 5, 8 and 12 above, and further in view of Huber (U.S. Patent No. 2,022,544) and Linderman (U.S. Patent No. 1,369,927).

Pettersen'097 in view of Black discloses all of the claimed limitations, as previously set forth, except for specifically calling for a brazing clip being formed from a

piece of sheet metal not being hole-punched, and both overlying clamping tabs (15) of the brazing clip being pressed into a top surface of a front portion of a brazing block while side portions of the bottom surface of the brazing clip have been pressed into the brazing block, and no flux existing between the brazing block and the brazing clip, and corners and short sides of the brazing clip not protruding outside the body of the brazing block.

However, a brazing clip being formed from a piece of sheet metal not being hole-punched, and no flux existing between the brazing block and the brazing clip is known in the art. Huber, for example teaches a brazing clip (brazing cap 5) consisting of two side portions (side portion 7) being formed from a piece of sheet metal not being hole-punched, and no flux existing between a brazing block (sheath 3) and the brazing clip (brazing cap 5). Huber further teaches such a configuration presents a means to provide the capability of withstanding excessive vibrations (page 1, lines 1-12; page 2, lines 2-19), thereby increasing the operational longevity of the bond.

Similarly, a brazing clip being formed with overlying clamping tabs and the brazing clip being pressed into a top surface of a front portion of a brazing block while side portions of the bottom surface of the brazing clip have been pressed into the brazing block is known in the art. Linderman, for example, teaches a brazing clip (6/5 combination) being formed with overlying clamping tabs (top portion; see Figures 16-19) and the brazing clip (6/5 combination) being pressed into a top surface of a front portion (front portion of sleeve 2) of a brazing block (sleeve 2) while side portions (6/5 combination) of the bottom surface of the brazing clip (6/5 combination) have been

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pressed into the brazing block (sleeve 2). It is known in the art that such a configuration provides a means to ensure an element is held in position and secured, thereby increasing the longevity of the physical bond.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the brazing clip of Pettersen'097 with the brazing clip being formed from a piece of sheet metal not being hole-punched, and no flux existing between the brazing block and the brazing clip of Huber in order to present a means to provide the capability of withstanding excessive vibrations, thereby increasing the operational longevity of the bond. Similarly, in view of Linderman, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the brazing clip of Pettersen'097 in view of Huber with the brazing clip consisting of two clamping tabs which are pressed into the front portion of brazing block to position the elements together, since it is known in the art that such a configuration provides a means to ensure an element is held in position and secured, thereby increasing the longevity of the physical bond. Moreover, to provide the corners and short sides (16) of the brazing clip to not protrude outside the body of the brazing block would have been a mere engineering expediency as Linderman clearly teaches the pressing of the brazing clip in order to get a tighter fit.

29. Claim 6, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Pettersen (U.S. Publication No. 2002/0190097) in view of Black (U.S.

Patent No. 2,834,551) as applied to claims 2, 4, 5, 8 and 12 above, and further in view of Shaver (U.S. Patent No. 2,019,935).

Pettersen'097 in view of Black discloses all of the claimed limitations, as previously set forth, except for specifically calling for an end portion of a brazing block of a joint part being shaped for and joined with a connection pipe, intended to subsequently receive in its other end a cable or thread.

However, an end portion of a block of a joint part being shaped for and joined with a connection pipe, intended to subsequently receive in its other end a cable or thread is known in the art. Shaver, for example, teaches an end portion (boss 14) of a block (terminal 5) of a joint part being shaped for and joined with a connection pipe (sleeve 11), intended to subsequently receive in its other end a cable or thread (conductor 4). Shaver further teaches such a configuration presents a means to provide a substantially flush connector end (page 2, lines 35-48). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the end portion of the brazing block of a joint part of Pettersen'097 in view of Black with the end portion of a block of a joint part being shaped for and joined with a connection pipe, intended to subsequently receive in its other end a cable or thread of Shaver in order to provide a substantially flush connector end.

30. Claims 7 and 11, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Pettersen (U.S. Publication No. 2002/0190097) in view of

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Black (U.S. Patent No. 2,834,551) as applied to claims 2, 4, 5, 8 and 12 above, and further in view of Genter (U.S. Patent No. 2,244,248).

Pettersen'097 in view of Black discloses all of the claimed limitations, as previously set forth, except for specifically calling for an end portion of a brazing block of a joint part being shaped with a connection where one or several threaded bolt portions are secured; and the end portion of the brazing block of the joint part being provided with one or several mounting holes.

However, an end portion of a block of a joint part being shaped with a connection where one or several threaded bolt portions are secured; and the end portion of the block of the joint part being provided with one or several mounting holes is known in the art. Genter, for example, teaches an end portion (surface 16) of a block (clamping plate 7) of a joint part being shaped with a connection where one or several threaded bolt (bolt 10) portions are secured; and the end portion (surface 16) of the block (clamping plate 7) of the joint part being provided with one or several mounting holes (9). Genter further teaches such a configuration provides a means for drawing and securing the plate in position (column 2, lines 33-38). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to the brazing block modify Pettersen'097 in view of Black an end portion of a block of a joint part being shaped with a connection where one or several threaded bolt portions are secured; and the end portion of the block of the joint part being provided with one or several mounting holes in order to provide a means for drawing and securing the plate in position.

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31. Claims 9 and 10, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Pettersen (U.S. Publication No. 2002/0190097) in view of Black (U.S. Patent No. 2,834,551) as applied to claims 2, 4, 5, 8 and 12 above, and further in view of Shuler (U.S. Patent No. 1,770,629).

Pettersen'097 in view of Black discloses all of the claimed limitations, as previously set forth, except for specifically calling for an end portion of a block of the joint part being provided with one or several tongues which are folded and pressed around or support optional elements; and the end portion of the block of the joint part being provided with side wings which are folded and pressed around a cable or thread, whereupon the compression joint is being brazed or welded.

However, an end portion of a block of the joint part being provided with one or several tongues which are folded and pressed around or support optional elements; and the end portion of the block of the joint part being provided with side wings which are folded and pressed around a cable or thread, whereupon the compression joint is being brazed or welded is known in the art. Shuler, for example, teach an end portion (see Figures 1-3) of the block (attachment 4) of the joint part being provided with one or several tongues (fingers 5) which are folded and pressed around or support optional elements (cable 3); and the end portion (see Figures 1-3) of the block (attachment 4) of the joint part being provided with side wings (fingers 5) which are folded and pressed around a cable or thread (cable 3), whereupon the compression joint is being brazed or welded (page 1, lines 30-72). Shuler further teaches such a configuration provides a means to engage closely the ends of the cable (page 1, lines 44-46). It would

have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the an end portion of the brazing block of a joint part of Pettersen'097 in view of Black with the end portion of a block of the joint part being provided with one or several tongues which are folded and pressed around or support optional elements; and the end portion of the block of the joint part being provided with side wings which are folded and pressed around a cable or thread, whereupon the compression joint is being brazed or welded of Shuler in order to provide a means to engage closely the ends of the cable.

Regarding the last two lines of claim 10 (describing how the compression joint is made i.e. welded or brazed), the limitation merely recites a product by process limitation. It is well settled that reciting how a product is made does not further limit the structure of the product itself. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted.) Therefore, an end portion (see Figures 1-3) of the block (attachment 4) of the joint part being provided with one or several tongues (fingers 5) which are folded and pressed around or support optional elements fully meets the limitations given its broadest reasonable interpretation.

32. Claims 1, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Huber (U.S. Patent No. 2,022,544) in view of Blad et al. (U.S. Patent No. 4,716,272), Black (U.S. Patent No. 2,834,551), Linderman (U.S. Patent No. 1,369,927) and Scott (U.S. Patent No. 3,828,706).

Huber discloses a method of manufacturing a new type of connecting piece of electrically conductive material (page 1, lines 2-30; see Figures 1-5), preferably a cable shoe, holder or connection device, (rail bond would be a cable shoe, holder or connection device) which is to be joined with another object of electrically conductive material (rail workpiece; see Figure 4), characterized in that a homogeneous body (see Figures 1, 2) consisting of front portion (front part of sheath 3), middle portion (middle part of sheath 3) and end portion (opposite end part of sheath 3), being formed into a brazing block (sheath 3), which, in its front portion (front part of Figure 1) is compressed by a brazing clip (brazing cap 5) to comprise a joint part, the brazing clip (brazing cap 5) consisting of two underlying parts (see Figure 2) which are pressed into the front portion (front part of sheath 3) of brazing block (sheath 3) and also an underlying middle portion (see Figure 1) and two side portions (side portion 7) outside a front portion (front portion of sheath 3) of the brazing block (sheath 3) and the brazing clip (brazing cap 5) being oriented in a transversal direction with respect to the brazing block (sheath 3) (page 1, lines 2-30; see Figures 1-5), and the end portion (opposite end part of sheath 3) of the brazing block (sheath 3) being formed to a co-operating part, and the brazing block (sheath 3) alone or joined in appropriate constellations using, for example, pressing, brazing, riveting, drilling or welding with other co-operating parts such as rings, pipes,

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threaded bolt parts, holes, wings, tongues, hooks or other brazing-block parts, as well as cables or threads, comprising a connecting piece (body 1; see Figures 1, 4, 5), for example, cable shoe, holder or connection device (page 1, lines 1-30; page 2, lines 2-19; see Figures 1-5).

Pettersen discloses all of the limitations of the claimed invention, as previously set forth, except for specifically calling for using a brazing process without residual detrimental martensite structure in the object under the braze joint, and the middle portion (9) being formed so that a semicircular raised guiding edge (12) of a shape adapted to a guard ring (22) attached during the brazing process is formed in connection with the front portion (8), and the surface of the front portion (8) of the brazing block being superficially modified by blasting, knurling and/or with cavities, or other surface-modifying measure.

However using a brazing process without residual detrimental martensite structure in the object under the braze joint is known in the art. Blad et al., for example teach using a brazing process without residual detrimental martensite structure in the object under the braze joint (column 5, lines 56-63). Blad et al. further teach such a configuration provides a means for preventing disadvantageous thermal actuation of the metal surface (Abstract; column 5, lines 56-63).

Similarly, the brazing clip consisting of two clamping tabs which are pressed into the front portion of brazing block is known in the art. Linderman, for example, teaches a brazing clip (6/5 combination) consisting of two clamping tabs (top portion; see Figures 16-19) which are pressed into the front portion (front portion of sleeve 2) of brazing

block (sleeve 2) (page 2, lines 6-24; see Figures 16-19). It is known in the art that such a configuration provides a means to ensure an element is held in position and secured, thereby increasing the longevity of the physical bond.

In addition, a middle portion being formed so that a raised guiding edge of a shape adapted to a guard ring attached during the brazing process is formed in connection with the front portion is known in the art. Scott, for example, teaches a middle portion (portion 62; see Figure 12) being formed so that a raised guiding edge (transition between 60 and 62) of a shape adapted to a guard ring attached during the brazing process is formed in connection with the front portion (portion 60). Scott further teaches such a configuration provides a means to not machine the entire workpiece (column 5, lines 3-15), thereby decreasing manufacturing costs. In addition, Scott teaches the work hardening of a portion of the tongue (12) could be utilized in forming any of the many possible terminal connections (column 5, lines 13-15).

Moreover, a surface of a front portion of a brazing block being superficially modified by blasting, knurling and/or with cavities, or other surface-modifying measure is known in the art. Black, for example, teaches a surface of the front portion (body portion 14) of the brazing block (terminal fitting 10) being superficially modified by blasting, knurling and/or with cavities, or other surface-modifying measure (grooves 22, 24, 22', 24'; column 1, line 46 – column 2, line 25; see Figures 1-8). Black further teaches such a configuration provides a means to remove the rail bond terminal from the rail without damaging the rail bond terminal, thereby allowing the rail bond terminal to be utilized again (column 1, lines 17-25).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the connection process of Huber with using the brazing process without residual detrimental martensite structure in the object under the braze joint of Blad et al. in order to prevent disadvantageous thermal actuation of the metal surface. Similarly, in view of Linderman, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the brazing clip of Huber with the brazing clip consisting of two clamping tabs which are pressed into the front portion of brazing block to position the elements together, since it is known in the art that such a configuration provides a means to ensure an element is held in position and secured, thereby increasing the longevity of the physical bond. In addition, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the middle portion of Huber with the middle portion being formed so that a raised guiding edge of a shape adapted to a guard ring attached during the brazing process is formed in connection with the front portion of Scott in order to provide a means to not machine the entire workpiece, thereby decreasing manufacturing costs. Furthermore, to provide the raised guiding edge being a semicircular raised guiding edge of a shape adapted to a guard ring attached during the brazing process is formed in connection with the front portion would have been a mere engineering expediency as Scott clearly teaches the potential of shaping the tongue of the terminal to a required terminal configuration in order to provide a means to not machine the entire workpiece. And moreover, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the brazing block of Huber in view of Blad et al. with the

brazing block being superficially modified by blasting, knurling and/or with cavities, or other surface-modifying measure of Black in order to provide a means to remove the rail bond terminal from the rail without damaging the rail bond terminal, thereby allowing the rail bond terminal to be utilized again.

33. Claims 2, 4, 5, 8 and 12, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Huber (U.S. Patent No. 2,022,544) in view of Black (U.S. Patent No. 2,834,551).

With respect to the limitation of claim 2, Huber discloses a connecting piece of electrically conductive material (page 1, lines 2-30; see Figures 1-5), preferably a cable shoe, a holder or a connection device, (rail bond would be a cable shoe, holder or connection device) which is to be joined with another object of electrically conductive material (rail workpiece; see Figure 4), characterized in that the connecting piece's joint part consists of a homogeneous brazing block (sheath 3) consisting of front portion (front part of sheath 3), middle portion (middle part of sheath 3) and end portion (opposite end part of sheath 3), and a secured brazing clip (brazing cap 5) encompassing the front portion (front part of sheath 3).

With respect to the limitations of claim 3, Huber discloses the brazing clip (brazing cap 5) consisting of two side portions (side portion 7) being formed from a piece of sheet metal not being hole-punched, and no flux existing between a brazing block (sheath 3) and the brazing clip (brazing cap 5).

With respect to the limitations of claims 4 and 8, Huber discloses the end portion (opposite end part of sheath 3) of the brazing block (sheath 3) of the joint part is shaped to fit into a pipe portion (see Figure 10), that a cable or thread (body 1; see Figures 1, 4, 5), together with the joint part (rail workpiece; see Figure 4), are inserted into a pipe portion (see Figures 1, 4, 5) that is being compressed, and that the compression joint is being brazed or welded.

Regarding the last two lines of claim 4 (i.e. describing how the joint/pipe portion is formed; and the compression joint is being brazed or welded), the limitation merely recites a product by process limitation. It is well settled that reciting how a product is made does not further limit the structure of the product itself. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted.). Therefore, the end portion (opposite end part of compact plate 26) of the brazing block (compact plate 26) of the joint part is shaped to fit into a pipe portion (see Figure 10) fully meets the limitations given its broadest reasonable interpretation.

With respect to the limitations of claim 5, Huber discloses the front portion (front part of sheath 3) of the brazing block (sheath 3) of the joint part (see Figures 1, 4, 5) being dimensioned to allow for modification of its shape according to the workpiece (rail

workpiece; see Figure 4) using available pressure from the guard ring (9; see Figure 5) together with the reached temperature, thereby accomplishing an evenly thick braze joint.

With respect to the limitations of claim 12, Huber discloses the front portion (front part of sheath 3) of the brazing block (sheath 3) of the joint part being common to one or several brazing blocks (sheath 3) (see Figures 1, 4, 5).

Pettersen discloses all of the limitations of the claimed invention, as previously set forth, except for a secured brazing clip encompassing the front portion and partially pressed into the top side, at least the top side of the front portion of the brazing block having had its surface enlarged by blasting and/or knurling or other surface-modifying measure so that the heat-absorption capability of the front portion from the electric arc manipulating the surface and the carbon deposit formed on the surface by the carbon electrode has increased, which thereby enables a rapid initial increase in temperature in the surface layer during the brazing process the surface layer, resulting in a more secure connection between the carbon layer and the top side of the front portion, a rapid initial increase in temperature in the front portion and in the brazing clip, resulting in a reduction of oxidation interference before the braze joint has been formed, and a relative reduction in cooling effect, mainly by heat conduction partially because of a changed ratio of surface to mass, partially because of the fact that the matter diverting the heat does not reach the higher temperatures at which the heat conductivity of the substance increases, which factors thereby together enable a dimensional increase of the connecting piece and a relative reduction of the energy necessary for the brazing

process, and the local ridges and peaks functioning to concentrate electrons or electron holes to facilitate the ignition and maintaining of an electric arc between the joint part and the carbon electrode, and cavities made in the surface draining and reducing the thickness of the carbon deposit and comprising anchoring points for the carbon deposit.

However, a secured brazing clip encompassing the front portion and partially pressed into the top side, at least the top side of the front portion of the brazing block having had its surface enlarged by blasting and/or knurling or other surface-modifying measure is known in the art. Black, for example, teaches a surface of the front portion (body portion 14) of the brazing block (terminal fitting 10) being superficially modified by blasting, knurling and/or with cavities, or other surface-modifying measure (grooves 22, 24, 22', 24'; column 1, line 46 – column 2, line 25; see Figures 1-8). Black further teaches such a configuration provides a means to remove the rail bond terminal from the rail without damaging the rail bond terminal, thereby allowing the rail bond terminal to be utilized again (column 1, lines 17-25). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the brazing block of Pettersen with the brazing block being superficially modified by blasting, knurling and/or with cavities, or other surface-modifying measure of Black in order to provide a means to remove the rail bond terminal from the rail without damaging the rail bond terminal, thereby allowing the rail bond terminal to be utilized again.

With respect to the limitations of "so that the heat-absorption capability of the front portion from the electric arc manipulating the surface and the carbon deposit formed on the surface by the carbon electrode has increased, which thereby enables a

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rapid initial increase in temperature in the surface layer during the brazing process the surface layer, resulting in a more secure connection between the carbon layer and the top side of the front portion, a rapid initial increase in temperature in the front portion and in the brazing clip, resulting in a reduction of oxidation interference before the braze joint has been formed, and a relative reduction in cooling effect, mainly by heat conduction partially because of a changed ratio of surface to mass, partially because of the fact that the matter diverting the heat does not reach the higher temperatures at which the heat conductivity of the substance increases, which factors thereby together enable a dimensional increase of the connecting piece and a relative reduction of the energy necessary for the brazing process, and the local ridges and peaks functioning to concentrate electrons or electron holes to facilitate the ignition and maintaining of an electric arc between the joint part and the carbon electrode, and cavities made in the surface draining and reducing the thickness of the carbon deposit and comprising anchoring points for the carbon deposit", MPEP § 2114 clearly states "While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. Black clearly teaches a surface of the front portion (body portion 14) of the brazing block (terminal fitting10) being superficially modified by blasting, knurling and/or with cavities, or other surface-modifying measure (grooves 22, 24, 22', 24'; column 1, line 46 – column 2, line 25; see Figures 1-8). Because claim 2 fails to further limit the apparatus in terms of structure, but rather only recite further functional limitations, the invention as taught by Pettersen in view of Black deemed fully capable of performing

such function. Therefore since Pettersen in view of Black explicitly teaches the structure and the functionality to perform the operation, the reference is complete as detail, as set forth above.

With respect to the limitations of "using a brazing process without residual detrimental martensite structure in this other object", MPEP § 2114 clearly states "While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. Black clearly teaches a surface of the front portion (body portion 14) of the brazing block (terminal fitting 10) being superficially modified by blasting, knurling and/or with cavities, or other surface-modifying measure (grooves 22, 24, 22', 24'; column 1, line 46 – column 2, line 25; see Figures 1-8). Because claim 2 fails to further limit the apparatus in terms of structure, but rather only recite further functional limitations, the invention as taught by Huber in view of Black deemed fully capable of performing such function. Therefore since Pettersen in view of Black explicitly teaches the structure and the functionality to perform the operation, the reference is complete as detail, as set forth above.

34. Claim 3, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Huber (U.S. Patent No. 2,022,544) in view of Black (U.S. Patent No. 2,834,551) as applied to claims 2, 4, 5, 8 and 12 above, and further in view of Linderman (U.S. Patent No. 1,369,927).

With respect to the limitations of claim 3, Huber discloses the brazing clip (brazing cap 5) consisting of two side portions (side portion 7) being formed from a piece of sheet metal not being hole-punched, and no flux existing between a brazing block (sheath 3) and the brazing clip (brazing cap 5).

Huber in view of Black discloses all of the claimed limitations, as previously set forth, except for specifically calling for overlying clamping tabs (15) of the brazing clip being pressed into a top surface of a front portion of a brazing block while side portions of the bottom surface of the brazing clip have been pressed into the brazing block, and corners and short sides of the brazing clip not protruding outside the body of the brazing block.

However, a brazing clip being formed with overlying clamping tabs and the brazing clip being pressed into a top surface of a front portion of a brazing block while side portions of the bottom surface of the brazing clip have been pressed into the brazing block is known in the art. Linderman, for example, teaches a brazing clip (6/5 combination) being formed with overlying clamping tabs (top portion; see Figures 16-19) and the brazing clip (6/5 combination) being pressed into a top surface of a front portion (front portion of sleeve 2) of a brazing block (sleeve 2) while side portions (6/5 combination) of the bottom surface of the brazing clip (6/5 combination) have been pressed into the brazing block (sleeve 2). It is known in the art that such a configuration provides a means to ensure an element is held in position and secured, thereby increasing the longevity of the physical bond.

Therefore, in view of Linderman, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the brazing clip of Huber in view of Black with the brazing clip consisting of two clamping tabs which are pressed into the front portion of brazing block to position the elements together, since it is known in the art that such a configuration provides a means to ensure an element is held in position and secured, thereby increasing the longevity of the physical bond. Moreover, to provide the corners and short sides of the brazing clip to not protrude outside the body of the brazing block would have been a mere engineering expediency as Linderman clearly teaches the pressing of the brazing clip in order to get a tighter fit.

35. Claim 6, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Huber (U.S. Patent No. 2,022,544) in view of Black (U.S. Patent No. 2,834,551) as applied to claims 2, 4, 5, 8 and 12 above, and further in view of Shaver (U.S. Patent No. 2,019,935).

Huber in view of Black discloses all of the claimed limitations, as previously set forth, except for specifically calling for an end portion of a brazing block of a joint part being shaped for and joined with a connection pipe, intended to subsequently receive in its other end a cable or thread.

However, an end portion of a block of a joint part being shaped for and joined with a connection pipe, intended to subsequently receive in its other end a cable or thread is known in the art. Shaver. For example, teach an end portion (boss 14) of a block (terminal 5) of a joint part being shaped for and joined with a connection pipe

(sleeve 11), intended to subsequently receive in its other end a cable or thread (conductor 4) Shaver further teaches such a configuration presents a means to provide a substantially flush connector end (page 2, lines 35-48). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the an end portion of the brazing block of a joint part of Huber in view of Black with the end portion of a block of a joint part being shaped for and joined with a connection pipe, intended to subsequently receive in its other end a cable or thread of Shaver in order to provide a substantially flush connector end.

36. Claims 7 and 11, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Huber (U.S. Patent No. 2,022,544) in view of Black (U.S. Patent No. 2,834,551) as applied to claims 2, 4, 5, 8 and 12 above, and further in view of Genter (U.S. Patent No. 2,244,248).

Huber in view of Black discloses all of the claimed limitations, as previously set forth, except for specifically calling for an end portion of a brazing block of a joint part being shaped with a connection where one or several threaded bolt portions are secured; and the end portion of the brazing block of the joint part being provided with one or several mounting holes.

However, an end portion of a block of a joint part being shaped with a connection where one or several threaded bolt portions are secured; and the end portion of the block of the joint part being provided with one or several mounting holes is known in the art. Genter, for example, teaches an end portion (surface 16) of a block (clamping plate

7) of a joint part being shaped with a connection where one or several threaded bolt (bolt 10) portions are secured; and the end portion (surface 16) of the block (clamping plate 7) of the joint part being provided with one or several mounting holes (9). Genter further teaches such a configuration provides a means for drawing and securing the plate in position (column 2, lines 33-38). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to the brazing block modify Huber in view of Black an end portion of a block of a joint part being shaped with a connection where one or several threaded bolt portions are secured; and the end portion of the block of the joint part being provided with one or several mounting holes in order to provide a means for drawing and securing the plate in position.

37. Claims 9 and 10, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Huber (U.S. Patent No. 2,022,544) in view of Black (U.S. Patent No. 2,834,551) as applied to claims 2, 4, 5, 8 and 12 above, and further in view of Shuler (U.S. Patent No. 1,770,629).

Huber in view of Black discloses all of the claimed limitations, as previously set forth, except for specifically calling for an end portion of a block of the joint part being provided with one or several tongues which are folded and pressed around or support optional elements; and the end portion of the block of the joint part being provided with side wings which are folded and pressed around a cable or thread, whereupon the compression joint is being brazed or welded.

However, an end portion of a block of the joint part being provided with one or several tongues which are folded and pressed around or support optional elements; and the end portion of the block of the joint part being provided with side wings which are folded and pressed around a cable or thread, whereupon the compression joint is being brazed or welded is known in the art. Shuler, for example, teach an end portion (see Figures 1-3) of the block (attachment 4) of the joint part being provided with one or several tongues (fingers 5) which are folded and pressed around or support optional elements (cable 3); and the end portion (see Figures 1-3) of the block (attachment 4) of the joint part being provided with side wings (fingers 5) which are folded and pressed around a cable or thread (cable 3), whereupon the compression joint is being is being brazed or welded (page 1, lines 30-72). Shuler further teaches such a configuration provides a means to engage closely the ends of the cable (page 1, lines 44-46). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the an end portion of the brazing block of a joint part of Huber in view of Black with the end portion of a block of the joint part being provided with one or several tongues which are folded and pressed around or support optional elements; and the end portion of the block of the joint part being provided with side wings which are folded and pressed around a cable or thread, whereupon the compression joint is being brazed or welded of Shuler in order to provide a means to engage closely the ends of the cable.

Regarding the last two lines of claim 10 (describing how the compression joint is made i.e. welded or brazed), the limitation merely recites a product by process limitation. It is well settled that reciting how a product is made does not further limit the

structure of the product itself. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted.) Therefore, an end portion (see Figures 1-3) of the block (attachment 4) of the joint part being provided with one or several tongues (fingers 5) which are folded and pressed around or support optional elements fully meets the limitations given its broadest reasonable interpretation.

38. To the degree it can be argued that Huber does not capable of "using a brazing process without residual detrimental martensite structure in this other object", the additional rejection is provided as set forth below:

39. Claims 2, 4, 5, 8 and 12, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Huber (U.S. Patent No. 2,022,544) in view of , Blad et al. (U.S. Patent No. 4,716,272) and Black (U.S. Patent No. 2,834,551).

With respect to the limitation of claim 2, Huber discloses a connecting piece of electrically conductive material (page 1, lines 2-30; see Figures 1-5), preferably a cable shoe, a holder or a connection device, (rail bond would be a cable shoe, holder or connection device) which is to be joined with another object of electrically conductive

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material (rail workpiece; see Figure 4), characterized in that the connecting piece's joint part consists of a homogeneous brazing block (sheath 3) consisting of front portion (front part of sheath 3), middle portion (middle part of sheath 3) and end portion (opposite end part of sheath 3), and a secured brazing clip (brazing cap 5) encompassing the front portion (front part of sheath 3).

With respect to the limitations of claim 3, Huber discloses the brazing clip (brazing cap 5) consisting of two side portions (side portion 7) being formed from a piece of sheet metal not being hole-punched, and no flux existing between a brazing block (sheath 3) and the brazing clip (brazing cap 5).

With respect to the limitations of claims 4 and 8, Huber discloses the end portion (opposite end part of sheath 3) of the brazing block (sheath 3) of the joint part is shaped to fit into a pipe portion (see Figure 10), that a cable or thread (body 1; see Figures 1, 4, 5), together with the joint part (rail workpiece; see Figure 4), are inserted into a pipe portion (see Figures 1, 4, 5) that is being compressed, and that the compression joint is being brazed or welded.

Regarding the last two lines of claim 4 (i.e. describing how the joint/pipe portion is formed; and the compression joint is being brazed or welded), the limitation merely recites a product by process limitation. It is well settled that reciting how a product is made does not further limit the structure of the product itself. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the

same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted.). Therefore, the end portion (opposite end part of compact plate 26) of the brazing block (compact plate 26) of the joint part is shaped to fit into a pipe portion (see Figure 10) fully meets the limitations given its broadest reasonable interpretation.

With respect to the limitations of claim 5, Huber discloses the front portion (front part of sheath 3) of the brazing block (sheath 3) of the joint part (see Figures 1, 4, 5) being dimensioned to allow for modification of its shape according to the workpiece (rail workpiece; see Figure 4) using available pressure from the guard ring (9; see Figure 5) together with the reached temperature, thereby accomplishing an evenly thick braze joint.

With respect to the limitations of claim 12, Huber discloses the front portion (front part of sheath 3) of the brazing block (sheath 3) of the joint part being common to one or several brazing blocks (sheath 3) (see Figures 1, 4, 5).

Pettersen discloses all of the limitations of the claimed invention, as previously set forth, except for specifically calling for using a brazing process without residual detrimental martensite structure in this other object; a secured brazing clip encompassing the front portion and partially pressed into the top side, at least the top side of the front portion of the brazing block having had its surface enlarged by blasting and/or knurling or other surface-modifying measure so that the heat-absorption capability of the front portion from the electric arc manipulating the surface and the

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carbon deposit formed on the surface by the carbon electrode has increased, which thereby enables a rapid initial increase in temperature in the surface layer during the brazing process the surface layer, resulting in a more secure connection between the carbon layer and the top side of the front portion, a rapid initial increase in temperature in the front portion and in the brazing clip, resulting in a reduction of oxidation interference before the braze joint has been formed, and a relative reduction in cooling effect, mainly by heat conduction partially because of a changed ratio of surface to mass, partially because of the fact that the matter diverting the heat does not reach the higher temperatures at which the heat conductivity of the substance increases, which factors thereby together enable a dimensional increase of the connecting piece and a relative reduction of the energy necessary for the brazing process, and the local ridges and peaks functioning to concentrate electrons or electron holes to facilitate the ignition and maintaining of an electric arc between the joint part and the carbon electrode, and cavities made in the surface draining and reducing the thickness of the carbon deposit and comprising anchoring points for the carbon deposit.

However using a brazing process without residual detrimental martensite structure in the object under the braze joint is known in the art. Blad et al., for example teach using a brazing process without residual detrimental martensite structure in the object under the braze joint (column 5, lines 56-63). Blad et al. further teach such a configuration provides a means for preventing disadvantageous thermal actuation of the metal surface (Abstract; column 5, lines 56-63).

Similarly, a secured brazing clip encompassing the front portion and partially pressed into the top side, at least the top side of the front portion of the brazing block having had its surface enlarged by blasting and/or knurling or other surface-modifying measure is known in the art. Black, for example, teaches a surface of the front portion (body portion 14) of the brazing block (terminal fitting10) being superficially modified by blasting, knurling and/or with cavities, or other surface-modifying measure (grooves 22, 24, 22', 24'; column 1, line 46 – column 2, line 25; see Figures 1-8). Black further teaches such a configuration provides a means to remove the rail bond terminal from the rail without damaging the rail bond terminal, thereby allowing the rail bond terminal to be utilized again (column 1, lines 17-25).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the connection process of Huber with using the brazing process without residual detrimental martensite structure in the object under the braze joint of Blad et al. in order to prevent disadvantageous thermal actuation of the metal surface. Similarly, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the brazing block of Pettersen with the brazing block being superficially modified by blasting, knurling and/or with cavities, or other surface-modifying measure of Black in order to provide a means to remove the rail bond terminal from the rail without damaging the rail bond terminal, thereby allowing the rail bond terminal to be utilized again.

With respect to the limitations of "so that the heat-absorption capability of the front portion from the electric arc manipulating the surface and the carbon deposit

formed on the surface by the carbon electrode has increased, which thereby enables a rapid initial increase in temperature in the surface layer during the brazing process the surface layer, resulting in a more secure connection between the carbon layer and the top side of the front portion, a rapid initial increase in temperature in the front portion and in the brazing clip, resulting in a reduction of oxidation interference before the braze joint has been formed, and a relative reduction in cooling effect, mainly by heat conduction partially because of a changed ratio of surface to mass, partially because of the fact that the matter diverting the heat does not reach the higher temperatures at which the heat conductivity of the substance increases, which factors thereby together enable a dimensional increase of the connecting piece and a relative reduction of the energy necessary for the brazing process, and the local ridges and peaks functioning to concentrate electrons or electron holes to facilitate the ignition and maintaining of an electric arc between the joint part and the carbon electrode, and cavities made in the surface draining and reducing the thickness of the carbon deposit and comprising anchoring points for the carbon deposit", MPEP § 2114 clearly states "While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. Black clearly teaches a surface of the front portion (body portion 14) of the brazing block (terminal fitting10) being superficially modified by blasting, knurling and/or with cavities, or other surface-modifying measure (grooves 22, 24, 22', 24'; column 1, line 46 – column 2, line 25; see Figures 1-8). Because claim 2 fails to further limit the apparatus in terms of structure, but rather only recite further functional limitations, the

invention as taught by Huber in view of Black deemed fully capable of performing such function. Therefore since Huber in view of Black explicitly teaches the structure and the functionality to perform the operation, the reference is complete as detail, as set forth above.

40. Claim 3, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Huber (U.S. Patent No. 2,022,544) in view of Blad et al.(U.S. Patent No. 4,716,272) and Black (U.S. Patent No. 2,834,551) as applied to claims 2, 4, 5, 8 and 12 above, and further in view of Linderman (U.S. Patent No. 1,369,927).

With respect to the limitations of claim 3, Huber discloses the brazing clip (brazing cap 5) consisting of two side portions (side portion 7) being formed from a piece of sheet metal not being hole-punched, and no flux existing between a brazing block (sheath 3) and the brazing clip (brazing cap 5).

Huber in view of Blad et al. and Black discloses all of the claimed limitations, as previously set forth, except for specifically calling for overlying clamping tabs (15) of the brazing clip being pressed into a top surface of a front portion of a brazing block while side portions of the bottom surface of the brazing clip have been pressed into the brazing block, and corners and short sides of the brazing clip not protruding outside the body of the brazing block.

However, a brazing clip being formed with overlying clamping tabs and the brazing clip being pressed into a top surface of a front portion of a brazing block while side portions of the bottom surface of the brazing clip have been pressed into the

brazing block is known in the art. Linderman, for example, teaches a brazing clip (6/5 combination) being formed with overlying clamping tabs (top portion; see Figures 16-19) and the brazing clip (6/5 combination) being pressed into a top surface of a front portion (front portion of sleeve 2) of a brazing block (sleeve 2) while side portions (6/5 combination) of the bottom surface of the brazing clip (6/5 combination) have been pressed into the brazing block (sleeve 2). It is known in the art that such a configuration provides a means to ensure an element is held in position and secured, thereby increasing the longevity of the physical bond.

Therefore, in view of Linderman, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the brazing clip of Huber in view of Blad et al. and Black with the brazing clip consisting of two clamping tabs which are pressed into the front portion of brazing block to position the elements together, since it is known in the art that such a configuration provides a means to ensure an element is held in position and secured, thereby increasing the longevity of the physical bond. Moreover, to provide the corners and short sides of the brazing clip to not protrude outside the body of the brazing block would have been a mere engineering expediency as Linderman clearly teaches the pressing of the brazing clip in order to get a tighter fit.

41. Claim 6, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Huber (U.S. Patent No. 2,022,544) in view of Blad et al.(U.S. Patent

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No. 4,716,272) and Black (U.S. Patent No. 2,834,551) as applied to claims 2, 4, 5, 8 and 12 above, and further in view of Shaver (U.S. Patent No. 2,019,935).

Huber in view of Blad et al. and Black discloses all of the claimed limitations, as previously set forth, except for specifically calling for an end portion of a brazing block of a joint part being shaped for and joined with a connection pipe, intended to subsequently receive in its other end a cable or thread.

However, an end portion of a block of a joint part being shaped for and joined with a connection pipe, intended to subsequently receive in its other end a cable or thread is known in the art. Shaver, For example, teach an end portion (boss 14) of a block (terminal 5) of a joint part being shaped for and joined with a connection pipe (sleeve 11), intended to subsequently receive in its other end a cable or thread (conductor 4) Shaver further teaches such a configuration presents a means to provide a substantially flush connector end (page 2, lines 35-48). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the an end portion of the brazing block of a joint part of Huber in view of Blad et al. and Black with the end portion of a block of a joint part being shaped for and joined with a connection pipe, intended to subsequently receive in its other end a cable or thread of Shaver in order to provide a substantially flush connector end.

42. Claims 7 and 11, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Huber (U.S. Patent No. 2,022,544) in view of Blad et al.(U.S.

Patent No. 4,716,272) and Black (U.S. Patent No. 2,834,551) as applied to claims 2, 4, 5, 8 and 12 above, and further in view of Genter (U.S. Patent No. 2,244,248).

Huber in view of Blad et al. and Black discloses all of the claimed limitations, as previously set forth, except for specifically calling for an end portion of a brazing block of a joint part being shaped with a connection where one or several threaded bolt portions are secured; and the end portion of the brazing block of the joint part being provided with one or several mounting holes.

However, an end portion of a block of a joint part being shaped with a connection where one or several threaded bolt portions are secured; and the end portion of the block of the joint part being provided with one or several mounting holes is known in the art. Genter, for example, teaches an end portion (surface 16) of a block (clamping plate 7) of a joint part being shaped with a connection where one or several threaded bolt (bolt 10) portions are secured; and the end portion (surface 16) of the block (clamping plate 7) of the joint part being provided with one or several mounting holes (9). Genter further teaches such a configuration provides a means for drawing and securing the plate in position (column 2, lines 33-38). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to the brazing block modify Huber in view of Black an end portion of a block of a joint part being shaped with a connection where one or several threaded bolt portions are secured; and the end portion of the block of the joint part being provided with one or several mounting holes in order to provide a means for drawing and securing the plate in position.

43. Claims 9 and 10, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Huber (U.S. Patent No. 2,022,544) in view of Blad et al.(U.S. Patent No. 4,716,272) and Black (U.S. Patent No. 2,834,551) as applied to claims 2, 4, 5, 8 and 12 above, and further in view of Shuler (U.S. Patent No. 1,770,629).

Huber in view of Blad et al. and Black discloses all of the claimed limitations, as previously set forth, except for specifically calling for an end portion of a block of the joint part being provided with one or several tongues which are folded and pressed around or support optional elements; and the end portion of the block of the joint part being provided with side wings which are folded and pressed around a cable or thread, whereupon the compression joint is being brazed or welded.

However, an end portion of a block of the joint part being provided with one or several tongues which are folded and pressed around or support optional elements; and the end portion of the block of the joint part being provided with side wings which are folded and pressed around a cable or thread, whereupon the compression joint is being brazed or welded is known in the art. Shuler, for example, teach an end portion (see Figures 1-3) of the block (attachment 4) of the joint part being provided with one or several tongues (fingers 5) which are folded and pressed around or support optional elements (cable 3); and the end portion (see Figures 1-3) of the block (attachment 4) of the joint part being provided with side wings (fingers 5) which are folded and pressed around a cable or thread (cable 3), whereupon the compression joint is being is being brazed or welded (page 1, lines 30-72). Shuler further teaches such a configuration provides a means to engage closely the ends of the cable (page 1, lines 44-46). It would

have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the an end portion of the brazing block of a joint part of Huber in view of Blad et al. and Black with the end portion of a block of the joint part being provided with one or several tongues which are folded and pressed around or support optional elements; and the end portion of the block of the joint part being provided with side wings which are folded and pressed around a cable or thread, whereupon the compression joint is being brazed or welded of Shuler in order to provide a means to engage closely the ends of the cable.

Regarding the last two lines of claim 10 (describing how the compression joint is made i.e. welded or brazed), the limitation merely recites a product by process limitation. It is well settled that reciting how a product is made does not further limit the structure of the product itself. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted.) Therefore, an end portion (see Figures 1-3) of the block (attachment 4) of the joint part being provided with one or several tongues (fingers 5) which are folded and pressed around or support optional elements fully meets the limitations given its broadest reasonable interpretation.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to STEPHEN J. RALIS whose telephone number is (571)272-6227. The examiner can normally be reached on Monday - Friday, 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tu Hoang can be reached on 571-272-4780. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Stephen J Ralis/  
Primary Examiner, Art Unit 3742

Stephen J Ralis  
Primary Examiner  
Art Unit 3742

SJR  
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